

AMENDMENTS TO THE CLAIMS

1 1. (Currently Amended) A method of automatically applying a quality of service
2 treatment to a bidirectional network data flow, comprising the steps of:
3 receiving at a first device the[[a]] bidirectional network data flow comprising at least
4 one outbound message element that is associated with an outbound quality of
5 service treatment value, wherein the first device is one of one or more devices;
6 creating and storing in a computer-readable medium an inbound quality of service
7 value in association with information identifying the bidirectional network
8 data flow; c
9 receiving one or more inbound message elements at a second device, wherein the
10 second device is one of the one or more devices and the second device is
11 distinct from the first device;
12 determining that the inbound message elements are associated with the same
13 bidirectional network data flow; [[and]]
14 accessing, from the second device, the computer-readable medium containing the
15 inbound quality of service value; and
16 applying the inbound quality of service value to the one or more inbound message
17 elements based on the stored information.

1 2. (Previously Presented) A method as recited in Claim 1, wherein receiving a
2 bidirectional network data flow comprises receiving a bidirectional network data flow
3 comprising at least one outbound message element that is marked with a DSCP value
4 and wherein applying the inbound quality of service value comprises marking the
5 inbound message elements with the DSCP value.

1 3. (Previously Presented) A method as recited in Claim 1, wherein receiving a
2 bidirectional network data flow comprises receiving a bidirectional network data flow
3 comprising one or more outbound message elements that are marked with a DSCP
4 value, and wherein applying the inbound quality of service value comprises retrieving
5 the inbound quality of service value from a mapping of DSCP values to associated

6 quality of service values, and adding the retrieved quality of service value to the
7 inbound message elements.

1 4. (Previously Presented) A method as recited in Claim 1, wherein the creating and
2 storing step comprises creating and storing a hash entry in a hash table that uniquely
3 identifies the bidirectional network data flow and that includes the inbound quality of
4 service value.

1 5. (Original) A method as recited in Claim 1, wherein applying the inbound quality of
2 service value to the inbound message elements based on the stored information
3 comprises automatically generating an inbound RSVP PATH message for the flow
4 when the inbound message elements include an RSVP PATH message.

1 6. (Currently Amended) A method as recited in Claim 1, wherein receiving a
2 bidirectional network data flow comprises receiving a bidirectional network data flow
3 comprising at least one outbound message element that includes [[an]] a first RSVP
4 PATH message and wherein applying the inbound quality of service value comprises
5 marking the inbound message elements with [[an]] a second RSVP PATH message,
6 wherein the second RSVP PATH message is created based on the first RSVP PATH
7 message.

1 7. (Currently Amended) A router apparatus capable of routing packets of data flows in a
2 packet-switched communications network and automatically applying quality of
3 service treatments to the data flows, comprising:
4 a memory configured to store information identifying the data flows and an inbound
5 quality service value associated with each of the data flows;
6 a stored program that can access the information in the memory and which, when
7 executed by the router apparatus, carries out the steps of:
8 receiving at a first device a bidirectional network data flow comprising at least
9 one outbound message element that is associated with an outbound

10 quality of service treatment value, wherein the first device is one of
11 one or more devices;
12 creating and storing in a computer-readable medium an inbound quality of
13 service value in association with information identifying the
14 bidirectional network data flow;
15 receiving one or more inbound message elements at a second device, wherein
16 the second device is one of the one or more devices and the second
17 device is distinct from the first device;
18 determining that the inbound message elements are associated with the same
19 bidirectional network data flow; [[and]]
20 accessing, from the second device, the computer-readable medium containing
21 the inbound quality of service value; and
22 applying the inbound quality of service value to the one or more inbound
23 message elements based on the stored information.

1 8. (Previously Presented) A router apparatus as recited in Claim 7, wherein the stored
2 program step of receiving a bidirectional network data flow comprises receiving a
3 bidirectional network data flow comprising at least one outbound message element
4 that is marked with a DSCP value and wherein applying the inbound quality of
5 service value comprises marking the inbound message elements with the DSCP value.

1 9. (Previously Presented) A router apparatus as recited in Claim 7, wherein the stored
2 program step of receiving a bidirectional network data flow comprises receiving a
3 bidirectional network data flow comprising one or more outbound message elements
4 that are marked with a DSCP value, and wherein applying the inbound quality of
5 service value comprises retrieving the inbound quality of service value from a
6 mapping of DSCP values to associated quality of service values, and adding the
7 retrieved quality of service value to the inbound message elements.

1 10. (Previously Presented) A router apparatus as recited in Claim 7, wherein the creating
2 and storing step comprises creating and storing a hash entry in a hash table that
3 uniquely identifies the bidirectional network data flow and that includes the inbound
4 quality of service value.

1 11. (Currently Amended) A router apparatus as recited in Claim 7, wherein receiving a
2 bidirectional network data flow comprises receiving a bidirectional network data flow
3 comprising at least one outbound message element that includes [[an]] a first RSVP
4 PATH message and wherein applying the inbound quality of service value comprises
5 marking the inbound message elements with [[an]] a second RSVP PATH message,
6 wherein the second RSVP PATH message is created based on the first RSVP path
7 message. ^{PATH}

1 12. (Currently Amended) A switch apparatus capable of switching packets of data flows
2 in a packet-switched communications network and automatically applying quality of
3 service treatments to the data flows, comprising:
4 a memory configured to store information identifying the data flows and an inbound
5 quality service value associated with each of the data flows;
6 a stored program that can access the information in the memory and which, when
7 executed by the switch apparatus, carries out the steps of:
8 receiving at a first device a bidirectional network data flow comprising at least
9 one outbound message element that is associated with an outbound
10 quality of service treatment value, wherein the first device is one of
11 one or more devices;
12 creating and storing in a computer-readable medium an inbound quality of
13 service value in association with information identifying the
14 bidirectional network data flow;
15 receiving one or more inbound message elements at a second device, wherein
16 the second device is one of the one or more devices and the second
17 device is distinct from the first device;

18 determining that the inbound message elements are associated with the same
19 bidirectional network data flow; [[and]]
20 accessing, from the second device, the computer-readable medium containing
21 the inbound quality of service value; and
22 applying the inbound quality of service value to the one or more inbound
23 message elements based on the stored information.

1 13. (Previously Presented) A switch apparatus as recited in Claim 12, wherein the stored
2 program step of receiving a bidirectional network data flow comprises receiving a
3 bidirectional network data flow comprising at least one outbound message element
4 that is marked with a DSCP value and wherein applying the inbound quality of
5 service value comprises marking the inbound message elements with the DSCP value.

1 14. (Previously Presented) A switch apparatus as recited in Claim 12, wherein the stored
2 program step of receiving a bidirectional network data flow comprises receiving a
3 bidirectional network data flow comprising one or more outbound message elements
4 that are marked with a DSCP value, and wherein applying the inbound quality of
5 service value comprises retrieving the inbound quality of service value from a
6 mapping of DSCP values to associated quality of service values, and adding the
7 retrieved quality of service value to the inbound message elements.

1 15. (Currently Amended) A switch apparatus as recited in Claim [[11]]12, wherein the
2 creating and storing step comprises creating and storing a hash entry in a hash table
3 that uniquely identifies the bidirectional network data flow and that includes the
4 inbound quality of service value.

1 16. (Currently Amended) A switch apparatus as recited in Claim [[11]]12, wherein
2 receiving a bidirectional network data flow comprises receiving a bidirectional
3 network data flow comprising at least one outbound message element that includes
4 [[an]] a first RSVP PATH message and wherein applying the inbound quality of

5 service value comprises marking the inbound message elements with [[an]] a second
6 RSVP PATH message, wherein the second RSVP PATH message is created based on
7 the first RSVP path message.

1 17. (Currently Amended) A computer-readable medium carrying one or more sequences
2 of instructions for automatically applying quality of service treatments to data flows
3 in a communications network, wherein execution of the one or more sequences of
4 instructions by one or more processors causes the one or more processors to perform
5 the steps of:

6 receiving at a first device a bidirectional network data flow comprising at least one
7 outbound message element that is associated with an outbound quality of
8 service treatment value, wherein the first device is one of one or more devices;
9 creating and storing in a computer-readable medium an inbound quality of service
10 value in association with information identifying the bidirectional network
11 data flow:

12 receiving one or more [✓]inbound message elements at a second device, wherein the
13 second device is one of the one or more devices and the second device is
14 distinct from the first device;

15 determining that the inbound message elements are associated with the same
16 bidirectional network data flow; [[and]]

17 accessing, from the second device, the computer-readable medium containing the
18 inbound quality of service value; and

19 applying the inbound quality of service value to the one or more inbound message
20 elements based on the stored information.

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1 18. (Currently Amended) A data communications network, comprising:
2 a first end station that communicates with other end stations in the network using
3 packetized message elements;
4 a first router coupled to the first end station and capable of routing the message
5 elements among the first end station and the other end stations and
6 automatically applying quality of service treatments to [[the]] data flows, and

7 comprising a memory configured to store information identifying the data
8 flows and an inbound quality service value associated with each of the data
9 flows, and a stored program that can access the information in the memory and
10 which, when executed by the first router apparatus, carries out the steps of:
11 receiving at the first router a bidirectional network data flow comprising at
12 least one outbound message element that is associated with an
13 outbound quality of service treatment value; and
14 creating and storing in a computer-readable medium an inbound quality of
15 service value in association with information identifying the
16 bidirectional network data flow;
17 a second router coupled to the first end station and capable of routing the message
18 elements among the first end station and the other end stations and
19 automatically applying quality of service treatments to the data flows, and
20 comprising a second memory configured to store information identifying the
21 data flows and an inbound quality service value associated with each of the
22 data flows, and a second stored program that can access the information in the
23 second memory and which, when executed by the second router, carries out
24 the steps of:
25 receiving one or more inbound message elements;
26 determining that the inbound message elements are associated with the
27 same bidirectional network data flow; [[and]]
28 accessing the computer-readable medium containing the inbound
29 quality of service value; and
30 applying the inbound quality of service value to the one or more
31 inbound message elements based on the stored information.

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1 19. (Currently Amended) A method of automatically applying a quality of service
2 treatment to a bidirectional network data flow in a packet-switched communications
3 network, comprising the steps of:
4 creating and storing a hash entry in a hash table [[of a]]stored in a computer-readable
5 medium communicatively coupled to a network a first device that uniquely

6 identifies an inbound quality of service value in association with information
7 identifying a bidirectional network data flow based on an outbound quality of
8 service value that is in at least one outbound message element that is
9 associated with the [[an]] outbound quality of service treatment value;
1 receiving one or more inbound message elements at a second device, wherein the
2 second device is one of the one or more devices and the second device is
3 distinct from the first device;
4 determining that the inbound message elements are associated with the same
5 bidirectional network data flow; [[and]]
6 accessing, from the second device, the computer-readable medium containing the
7 inbound quality of service value; and
8 applying the inbound quality of service value to the one or more inbound message
9 elements based on the stored information.

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1 20. (Previously Presented) A method as recited in Claim 19, wherein the bidirectional
2 network data flow comprises at least one outbound message element that is marked
3 with a DSCP value and wherein applying the inbound quality of service value
4 comprises marking the inbound message elements with the DSCP value.

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1 21. (Previously Presented) A method as recited in Claim 19, wherein the bidirectional
2 network data flow comprises one or more outbound message elements that are marked
3 with a DSCP value, and wherein applying the inbound quality of service value
4 comprises retrieving the inbound quality of service value from a mapping of DSCP
5 values to associated quality of service values, and adding the retrieved quality of
6 service value to the inbound message elements.

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1 22. (Currently Amended) A method as recited in Claim 19, wherein receiving a
2 bidirectional network data flow comprises receiving a bidirectional network data flow
3 comprising at least one outbound message element that includes [[an]] a first RSVP
4 PATH message and wherein applying the inbound quality of service value comprises
5 marking the inbound message elements with [[an]] a second RSVP PATH message,

PATH

6 wherein the second RSVP PATH message is created based on the first RSVP path
7 message.

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1 23. (New) The computer readable medium of Claim 17, wherein receiving a bidirectional
2 network data flow comprises receiving a bidirectional network data flow comprising
3 at least one outbound message element that is marked with a DSCP value and wherein
4 applying the inbound quality of service value comprises marking the inbound
5 message elements with the DSCP value.

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1 24. (New) The computer readable medium of Claim 17, wherein receiving a bidirectional
2 network data flow comprises receiving a bidirectional network data flow comprising
3 one or more outbound message elements that are marked with a DSCP value, and
4 wherein applying the inbound quality of service value comprises retrieving the
5 inbound quality of service value from a mapping of DSCP values to associated quality
6 of service values, and adding the retrieved quality of service value to the inbound
7 message elements.

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1 25. (New) The computer readable medium of Claim 17, wherein the creating and storing
2 step comprises creating and storing a hash entry in a hash table that uniquely
3 identifies the bidirectional network data flow and that includes the inbound quality of
4 service value.

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1 26. (New) The computer readable medium of Claim 17, wherein applying the inbound
2 quality of service value to the inbound message elements based on the stored
3 information comprises automatically generating an inbound RSVP PATH message for
4 the flow when the inbound message elements include an RSVP PATH message.

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1 27. (New) The computer readable medium of Claim 17, wherein receiving a bidirectional
2 network data flow comprises receiving a bidirectional network data flow comprising
3 at least one outbound message element that includes a first RSVP PATH message and

4 wherein applying the inbound quality of service value comprises marking the inbound
5 message elements with a second RSVP PATH message, wherein the second RSVP
6 PATH message is created based on the first RSVP PATH message.

1 28. (New) An apparatus for automatically applying a quality of service treatment to a
2 bidirectional network data flow, comprising:
3 means for receiving at a first device a bidirectional network data flow comprising at
4 least one outbound message element that is associated with an outbound
5 quality of service treatment value, wherein the first device is one of one or
6 more devices;
7 means for creating and storing in a computer-readable medium an inbound quality of
8 service value in association with information identifying the bidirectional
9 network data flow;
10 means for receiving one or more inbound message elements at a second device,
11 wherein the second device is one of the one or more devices and the second
12 device is distinct from the first device;
13 means for determining that the inbound message elements are associated with the
14 same bidirectional network data flow;
15 means for accessing, from the second device, the computer-readable medium
16 containing the inbound quality of service value; and
17 means for applying the inbound quality of service value to the one or more inbound
18 message elements based on the stored information.

1 29. (New) The apparatus of Claim 28, wherein receiving a bidirectional network data
2 flow comprises receiving a bidirectional network data flow comprising at least one
3 outbound message element that is marked with a DSCP value and wherein applying
4 the inbound quality of service value comprises marking the inbound message
5 elements with the DSCP value.

1 30. (New) The apparatus of Claim 28, wherein receiving a bidirectional network data
2 flow comprises receiving a bidirectional network data flow comprising one or more

3 outbound message elements that are marked with a DSCP value, and wherein
4 applying the inbound quality of service value comprises retrieving the inbound quality
5 of service value from a mapping of DSCP values to associated quality of service
6 values, and adding the retrieved quality of service value to the inbound message
7 elements.

1 31. (New) The apparatus of Claim 28, wherein the creating and storing step comprises
2 creating and storing a hash entry in a hash table that uniquely identifies the
3 bidirectional network data flow and that includes the inbound quality of service value.

1 32. (New) The apparatus of Claim 28, wherein applying the inbound quality of service
2 value to the inbound message elements based on the stored information comprises
3 automatically generating an inbound RSVP PATH message for the flow when the
4 inbound message elements include an RSVP PATH message.

1 33. (New) The apparatus of Claim 28, wherein receiving a bidirectional network data
2 flow comprises receiving a bidirectional network data flow comprising at least one
3 outbound message element that includes a first RSVP PATH message and wherein
4 applying the inbound quality of service value comprises marking the inbound
5 message elements with a second RSVP PATH message, wherein the second RSVP
6 PATH message is created based on the first RSVP ^{PATH} message.

1 34. (New) A method of automatically applying a quality of service treatment to a
2 bidirectional network data flow, comprising the steps of:
3 receiving at a first device the bidirectional network data flow comprising at least one
4 outbound message element that is associated with a particular quality of
5 service treatment value, wherein the first device is one of one or more devices;
6 creating and storing in a computer-readable medium the particular quality of service
7 value in association with information identifying the bidirectional network
8 data flow;

9 receiving a request for a quality of service value for an inbound message element
10 from a second device of one or more devices, wherein the inbound message
11 element is associated with the particular bidirectional message flow, wherein
12 the second device is distinct from the first device; and
13 providing the particular quality of service value to the second device.

1 35. (New) The method of Claim 34, wherein receiving a bidirectional network data flow
2 comprises receiving a bidirectional network data flow comprising at least one
3 outbound message element that is marked with a DSCP value and wherein providing
4 the particular quality of service value comprises providing the DSCP value.

1 36. (New) The method of Claim 34, wherein receiving a bidirectional network data flow
2 comprises receiving a bidirectional network data flow comprising one or more
3 outbound message elements that are marked with a DSCP value, and wherein
4 providing the particular quality of service value comprises retrieving the particular
5 quality of service value from a mapping of DSCP values to associated quality of
6 service values, and providing the retrieved quality of service value to the second
7 device.

1 37. (New) The method of Claim 34, wherein the creating and storing step comprises
2 creating and storing a hash entry in a hash table that uniquely identifies the
3 bidirectional network data flow and that includes the inbound quality of service value.

1 38. (New) The method of Claim 34, wherein receiving a bidirectional network data flow
2 comprises receiving a bidirectional network data flow comprising at least one
3 outbound message element that includes a first RSVP PATH message and wherein
4 providing the particular quality of service value comprises providing a second RSVP
5 PATH message, wherein the second RSVP PATH message is created based on the
6 first RSVP ~~path~~ ^{PATH} message.
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1 39. (New) A method of automatically applying a quality of service treatment to a
2 bidirectional network data flow, comprising the steps of:
3 receiving one or more inbound message elements at a first device, wherein the first
4 device is one of the one or more devices, the inbound message element is part
5 of a bidirectional network data flow, no outbound message elements have been
6 received at the first device, and no quality of service value is specified in the
7 one or more inbound message elements;
8 accessing a computer-readable medium containing a particular quality of service
9 value associated with the bidirectional network data flow, wherein the quality
10 of service value was stored in the computer-readable medium by a second
11 device based on an outbound message element associated with the
12 bidirectional network data flow and the first device is distinct from the second
13 device;
14 determining that the inbound message elements are associated with the same
15 bidirectional network data flow; and
16 applying the particular quality of service value to the one or more inbound message
17 elements.

1 40. (New) The method of Claim 39, wherein one or more outbound message elements of
2 the outbound message elements are marked with a DSCP value and wherein applying
3 the particular quality of service value comprises marking the inbound message
4 elements with the DSCP value.

1 41. (New) The method of Claim 39, wherein one or more outbound message elements of
2 the outbound message elements are marked with a DSCP value, and wherein applying
3 the particular quality of service value comprises retrieving the particular quality of
4 service value from a mapping of DSCP values to associated quality of service values,
5 and adding the retrieved quality of service value to the inbound message elements.

1 42. (New) The method of Claim 39, wherein applying the particular quality of service
2 value to the inbound message elements based on the stored information comprises
3 automatically generating an inbound RSVP PATH message for the flow when the
4 inbound message elements include an RSVP PATH message.

1 43. (New) The method of Claim 39, wherein one or more outbound message elements of
2 the one outbound message elements include a first RSVP PATH message and wherein
3 applying the particular quality of service value comprises marking the inbound
4 message elements with a second RSVP PATH message.
